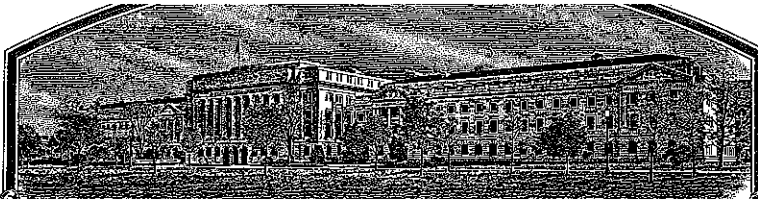


No.

200600246



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Washington State University Research Foundation

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE FOREGOING PURPOSES, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

WHEAT, COMMON

'MDM'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this sixth day of December, in the year two thousand and six.

Attest:

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

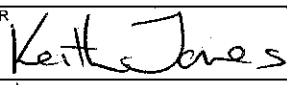
Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE
(Instructions and information collection burden statement on reverse)

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF OWNER Washington State University Research Foundation		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME WA007936		3. VARIETY NAME MDM	
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country) 1610 NE Eastgate Blvd. Pullman, WA 99163		5. TELEPHONE (include area code) 509-335-4363		<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center; margin: 0;">FOR OFFICIAL USE ONLY</p> <p style="margin: 0;">PVPO NUMBER</p> <p style="font-size: 24px; margin: 0;">200600246</p> <p style="margin: 0;">FILING DATE</p> <p style="font-size: 24px; margin: 0;">July 24, 2006</p> </div>	
		6. FAX (include area code) 509-335-7237			
7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION (corporation, partnership, association, etc.) Corporation		8. IF INCORPORATED, GIVE STATE OF INCORPORATION WA		9. DATE OF INCORPORATION July 7, 1939	
10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION. (First person listed will receive all papers) Dr. Keith Jones, Director Washington State University Research Foundation 1610 NE Eastgate Blvd. Pullman, WA 99163				<div style="border: 1px solid black; padding: 5px;"> <p>FILING AND EXAMINATION FEES: \$ 4387.00 DATE 7/24/06 CERTIFICATION FEE: \$ 768.00 DATE 11/21/2006</p> </div>	
11. TELEPHONE (Include area code) 509-335-4363		12. FAX (Include area code) 509-335-7237		13. E-MAIL jonesk@wsu.edu	
14. CROP KIND (Common Name) Winter Wheat		16. FAMILY NAME (Botanical) Gramineae		18. DOES THE VARIETY CONTAIN ANY TRANSGENES? (OPTIONAL) <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF SO, PLEASE GIVE THE ASSIGNED USDA-APHIS REFERENCE NUMBER FOR THE APPROVED PETITION TO DEREGULATE THE GENETICALLY MODIFIED PLANT FOR COMMERCIALIZATION.	
15. GENUS AND SPECIES NAME OF CROP Triticum aestivum L.		17. IS THE VARIETY A FIRST GENERATION HYBRID? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO			
19. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow instructions on reverse)				20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD AS A CLASS OF CERTIFIED SEED? (See Section 83(a) of the Plant Variety Protection Act) <input type="checkbox"/> YES (If "yes", answer items 21 and 22 below) <input checked="" type="checkbox"/> NO (If "no", go to item 23)	
a. <input checked="" type="checkbox"/> Exhibit A. Origin and Breeding History of the Variety b. <input checked="" type="checkbox"/> Exhibit B. Statement of Distinctness c. <input checked="" type="checkbox"/> Exhibit C. Objective Description of Variety d. <input type="checkbox"/> Exhibit D. Additional Description of the Variety (Optional) e. <input checked="" type="checkbox"/> Exhibit E. Statement of the Basis of the Owner's Ownership f. <input checked="" type="checkbox"/> Exhibit F. Declaration Regarding Deposit g. <input checked="" type="checkbox"/> Voucher Sample (3,000 viable untreated seeds or, for tuber propagated varieties, verification that tissue culture will be deposited and maintained in an approved public repository) g. <input checked="" type="checkbox"/> Filing and Examination Fee (\$4,382), made payable to "Treasurer of the United States" (Mail to the Plant Variety Protection Office)				21. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF CLASSES? <input type="checkbox"/> YES <input type="checkbox"/> NO IF YES, WHICH CLASSES? <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED	
				22. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? <input type="checkbox"/> YES <input type="checkbox"/> NO IF YES, SPECIFY THE NUMBER 1,2,3, etc. FOR EACH CLASS. <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED (If additional explanation is necessary, please use the space indicated on the reverse.)	
23. HAS THE VARIETY (INCLUDING ANY HARVESTED MATERIAL) OR A HYBRID PRODUCED FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U. S. OR OTHER COUNTRIES? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES. (Please use space indicated on reverse.)				24. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT (PLANT BREEDER'S RIGHT OR PATENT)? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, PLEASE GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. (Please use space indicated on reverse.)	
25. The owners declare that a viable sample of basic seed of the variety has been furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate. The undersigned owner(s) is(are) the owner of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act. Owner(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.					
SIGNATURE OF OWNER 			SIGNATURE OF OWNER		
NAME (Please print or type) Dr. Keith Jones			NAME (Please print or type)		
CAPACITY OR TITLE Director, Washington State University Research Foundation		DATE 20 July 2006		CAPACITY OR TITLE	
				DATE	

(See reverse for instructions and information collection burden statement)

GENERAL INSTRUCTIONS: To be effectively filed with the Plant Variety Protection Office (PVPO), **ALL** of the following items must be received in the PVPO: (1) Completed application form signed by the owner; (2) completed exhibits A, B, C, E, F; (3) for a tuber reproduced variety, verification that a viable (in the sense that it will reproduce an entire plant) tissue culture will be deposited and maintained in an approved public repository; and (4) payment by credit card or check drawn on a U.S. bank for \$4,382 (\$518 filing fee and \$3,864 examination fee), payable to "Treasurer of the United States" (See Section 97.6 of the Regulations and Rules of Practice). **NEW:** With the application for a seed reproduced variety or by direct deposit soon after filing, the applicant must provide at least 3,000 viable untreated seeds of the variety *per se*, and for a hybrid variety at least 3,000 untreated seeds of each line necessary to reproduce the variety. Partial applications will be held in the PVPO for not more than 90 days; then returned to the applicant as un-filed. Mail application and other requirements to Plant Variety Protection Office, AMS, USDA, Room 401, NAL Building, 10301 Baltimore Avenue, Beltsville, MD 20705-2351. Retain one copy for your files. All items on the face of the application are self explanatory unless noted below. Corrections on the application form and exhibits must be initialed and dated. **DO NOT** use masking materials to make corrections. If a certificate is allowed, you will be requested to send a payment by credit card or check payable to "Treasurer of the United States" in the amount of \$768 for issuance of the certificate. Certificates will be issued to owner, not licensee or agent.

NOTES: It is the responsibility of the applicant/owner to keep the PVPO informed of any changes of address or change of ownership or assignment or owner's representative during the life of the application/certificate. The fees for filing a change of address; owner's representative; ownership or assignment; or any modification of owner's name is specified in Section 97.175 of the regulations. (See Section 101 of the Act, and Sections 97.130, 97.131, 97.175(h) of the Regulations and Rules of Practice.)

Plant Variety Protection Office
Telephone: (301) 504-5518 **FAX:** (301) 504-5291
General E-mail: PVPOmail@usda.gov
Homepage: <http://www.ams.usda.gov/science/pvpo/PVPIndex.htm>

SPECIFIC INSTRUCTIONS:

To avoid conflict with other variety names in use, the applicant must check the appropriate recognized authority and **provide evidence** that the permanent name of the application variety (even if it is a parental, inbred line) has been cleared by the appropriate recognized authority before the Certificate of Protection is issued. For example, for agricultural and vegetable crops, contact: U.S. Department of Agriculture, Agricultural Marketing Service, Livestock and Seed Programs, **Seed Regulatory and Testing Branch**, 801 Summit Crossing Place, Suite C, Gastonia, North Carolina 28054-2193 Telephone: (704) 810-8870. <http://www.ams.usda.gov/lsg/seed.htm>.

ITEM

- 19a. Give: (1) the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method;
 (2) the details of subsequent stages of selection and multiplication;
 (3) evidence of uniformity and stability; and
 (4) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified
- 19b. Give a summary of the variety's distinctness. Clearly state how this application variety may be distinguished from all other varieties in the same crop. If the new variety is most similar to one variety or a group of related varieties:
 (1) identify these varieties and state all differences objectively;
 (2) attach replicated statistical data for characters expressed numerically and demonstrate that these are clear differences; and
 (3) submit, if helpful, seed and plant specimens or photographs (prints) of seed and plant comparisons which clearly indicate distinctness.
- 19c. Exhibit C forms are available from the PVPO Office for most crops; specify crop kind. Fill in Exhibit C (Objective Description of Variety) form as completely as possible to describe your variety.
- 19d. Optional additional characteristics and/or photographs. Describe any additional characteristics that cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the characteristics that are difficult to describe, such as plant habit, plant color, disease resistance, etc.
- 19e. Section 52(5) of the Act requires applicants to furnish a statement of the basis of the applicant's ownership. An Exhibit E form is available from the PVPO.
20. If "Yes" is specified (*seed of this variety be sold by variety name only, as a class of certified seed*), the applicant **MAY NOT** reverse this affirmative decision after the variety has been sold and so labeled, the decision published, or the certificate issued. However, if "No" has been specified, the applicant may change the choice. (See Regulations and Rules of Practice, Section 97.103).
23. See Sections 41, 42, and 43 of the Act and Section 97.5 of the regulations for eligibility requirements.
24. See Section 55 of the Act for instructions on claiming the benefit of an earlier filing date.

22. CONTINUED FROM FRONT (Please provide a statement as to the limitation and sequence of generations that may be certified.)

23. CONTINUED FROM FRONT (Please provide the date of first sale, disposition, transfer, or use for each country and the circumstances, if the variety (including any harvested material) or a hybrid produced from this variety has been sold, disposed of, transferred, or used in the U.S. or other countries.)

Foundation seed of MDM was sold on 9/21/05 by the Washington State Crop Improvement Association.

24. CONTINUED FROM FRONT (Please give the country, date of filing or issuance, and assigned reference number, if the variety or any component of the variety is protected by intellectual property right (Plant Breeder's Right or Patent).)

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 1.4 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410, or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

EXHIBIT A – BREEDING HISTORY**‘MDM’**

1. Genealogy: ‘Klasic’ (PI 486139)/5*‘Eltan’ (PI 536994)

2. Stages of Selection and Multiplication:

1995 - 1997: Original cross and subsequent backcrosses were made in the Washington State University (WSU) Wheat Plant Growth Center.

1998: BC₃F₁ generation; advanced on WSU research land; all plants uniform.

1999: BC₃F₂ bulk population; WSU research land; no selection applied; segregating for maturity, plant height, disease resistance and awn length.

2000: BC₃F₃ bulk population; WSU research land; no selection applied; segregating for maturity, plant height, disease resistance and awn length.

2001: BC₃F₄ single plot (tested as J980628); WSU research land; randomly selected 100 single spikes from selected plots based on general adaptation, plant height, maturity, disease resistance, grain yield and test weight.

2002: BC₃F_{4.5} head row; WSU research land; head rows bulk harvested and seed hardness (AACC, Method 55-31) was determined for each head row. BC₃F_{4.6} seed from head rows that were hard (> 70 single kernel hardness) were then bulked for each head row; no variants were observed within the rows.

2003: BC₃F_{4.6} WSU Commercial Variety Trial (tested as WA007936); replicated yield trial at multiple locations in Washington State; selection based on appropriate plant height, maturity, field resistance to stripe rust and foot rot, test weight, grain yield, and milling/baking quality; no variants were observed within the plot.

Individual BC₃F_{4.7} heads (3000) of WA007936 were hand threshed and separately planted in head rows in the fall of 2003 with irrigation in Othello, WA for Breeder seed production. Breeder seed was bulk harvested from a reselection of the head row block, based on phenotypic uniformity, in August 2004 and planted in October 2004 for Foundation seed.

2004: WA007936 approved for release as the cultivar ‘MDM’: PI 634716

3. Evidence of Uniformity and Stability:

Except as noted below, MDM has been observed to be stable and uniform with respect to plant morphology since 1998 as a BC₃F₁-derived line. This represents seven generations (1998- 2005) through which this stability and uniformity have been observed. Based on evaluations of Breeder and Foundation seed lots, MDM may contain a naturally occurring variant of up to one ~~white~~ seed in 10,000 (0.01%). In addition to the previously mention variant the following observation may be made: (1) height variation

Red

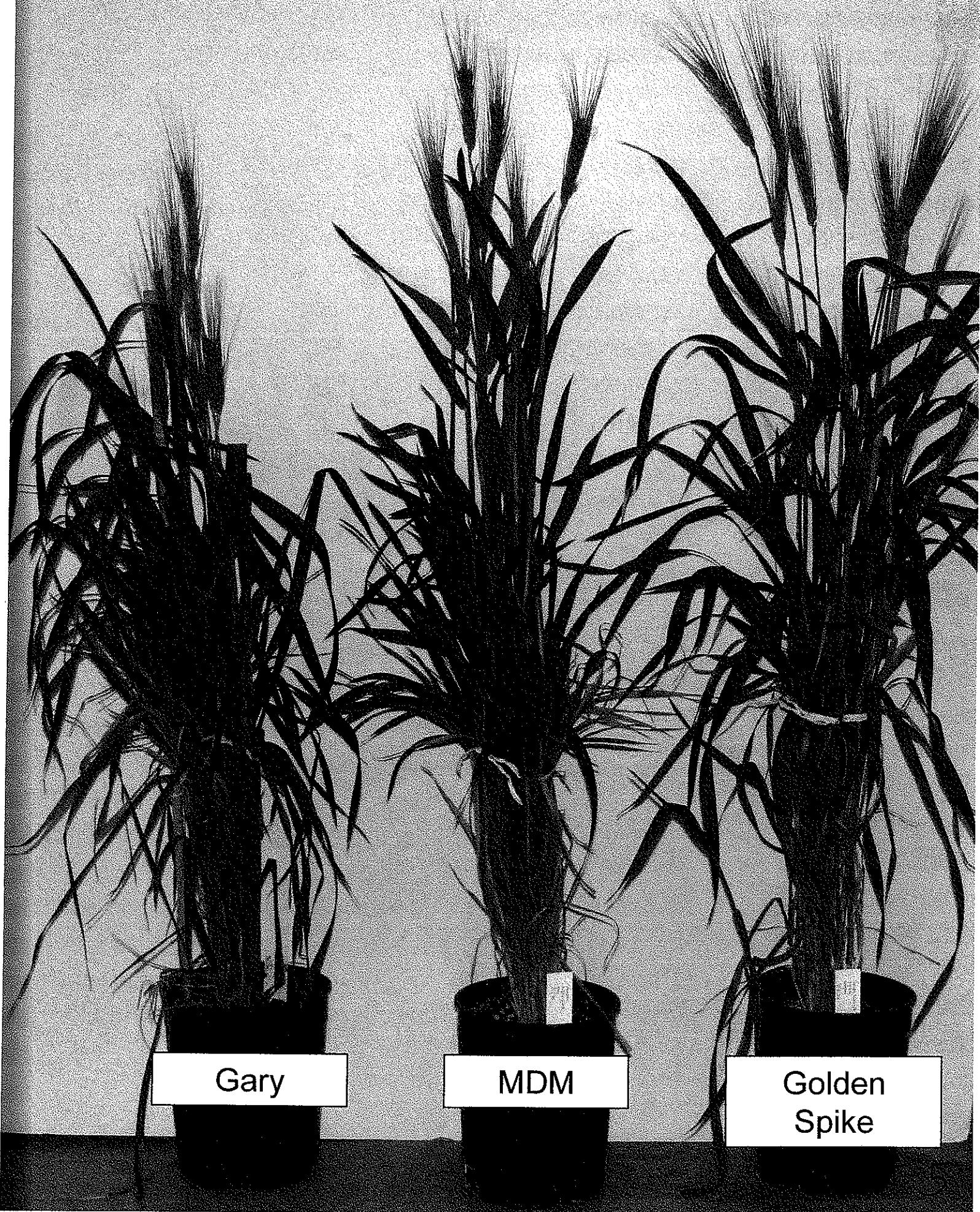
MAH
10-18-2006

(2" to 10" taller) may occur at the rate of 1 in 10,000 (0.01%) for heads that are otherwise typical of this variety. Height variation will be noticeable under higher yielding environments. (2) awn length may be variable (awnletted to normal). (3) awn color (red or tan).

These variants described are distinct within the variety and are stable and predictable with a degree of reliability comparable to other varieties of the same kind, and within recognized tolerances when the variety is reproduced or reconstructed and was originally part of the variety when released.

4. Variants during reproduction:

Based on evaluations of experimental, Breeder and Foundation seed lots, no variants other than those noted previously were observed in MDM. Aberrant progeny are rogued from seedstock fields to ensure continued uniformity and stability, but they will continue to occur in every generation.



Gary

MDM

Golden
Spike

Exhibit B. Statement of Distinctness

MDM is most similar to Gary and Golden Spike for hard white winter wheat production in eastern Washington State.

A. Agronomic Characteristics

Heading date for Gary, Golden Spike and MDM are described below. Number of plants used: 4 replications of 10 plants from each trial (240 plants for each variety overall).

1. Analysis of variance combined over locations indicates that MDM has a heading date later than Gary (mean = 2.5 days) and Golden Spike (mean = 2.25 days), with an LSD of 0.37 (prob. 0.1) under Washington State field conditions. Data for each location as well as over locations are shown in Table A1.

Table A1. Heading date of MDM, Gary and Golden Spike in commercial variety trials at 6 locations in Washington State in crop year 2004.

		Location						
Planting/Harvest Dates		247/224	241/203	280/216	254/211	238/223	247/224	
Trait	Variety	Pullman	Lind	Walla Walla	Ritzville	St. Andrews	Almira	Mean
Heading (Day of Year)	Gary	167.50	139.50	139.50	141.50	154.00	165.00	151.17
	Golden Spike	167.75	138.00	141.50	141.00	153.25	165.75	151.21
	MDM	170.00	140.75	143.00	143.50	156.75	166.25	153.33
	MEAN	168.42	139.42	141.33	142.00	154.67	165.67	151.90
	LSD (0.05)	0.51	0.94	1.02	1.02	1.79	0.40	0.37
	SD	1.24	1.31	1.61	1.28	2.10	0.51	11.95
	CV	0.22	0.49	0.53	0.52	0.84	0.17	0.50

*Combined analysis of variance was conducted after the assumptions for combining data over locations were met (variances were homogenous and the data was distributed normally).

B. Genetic Characteristics

The uniqueness of MDM as compared to Gary and Golden Spike is confirmed by two microsatellite loci: Xgwm304, Xgwm174 (Figures 1A, 1B), and Xbarc115 and Xgwm427 (Figures 2A and 2B).

References:

Röder, MS, V Korzun, K Wendehake, J Plaschke, M-H Tixier, P. Leroy, and MW Ganal. 1998. A microsatellite map of wheat. *Genetics* 149:2007-2023.

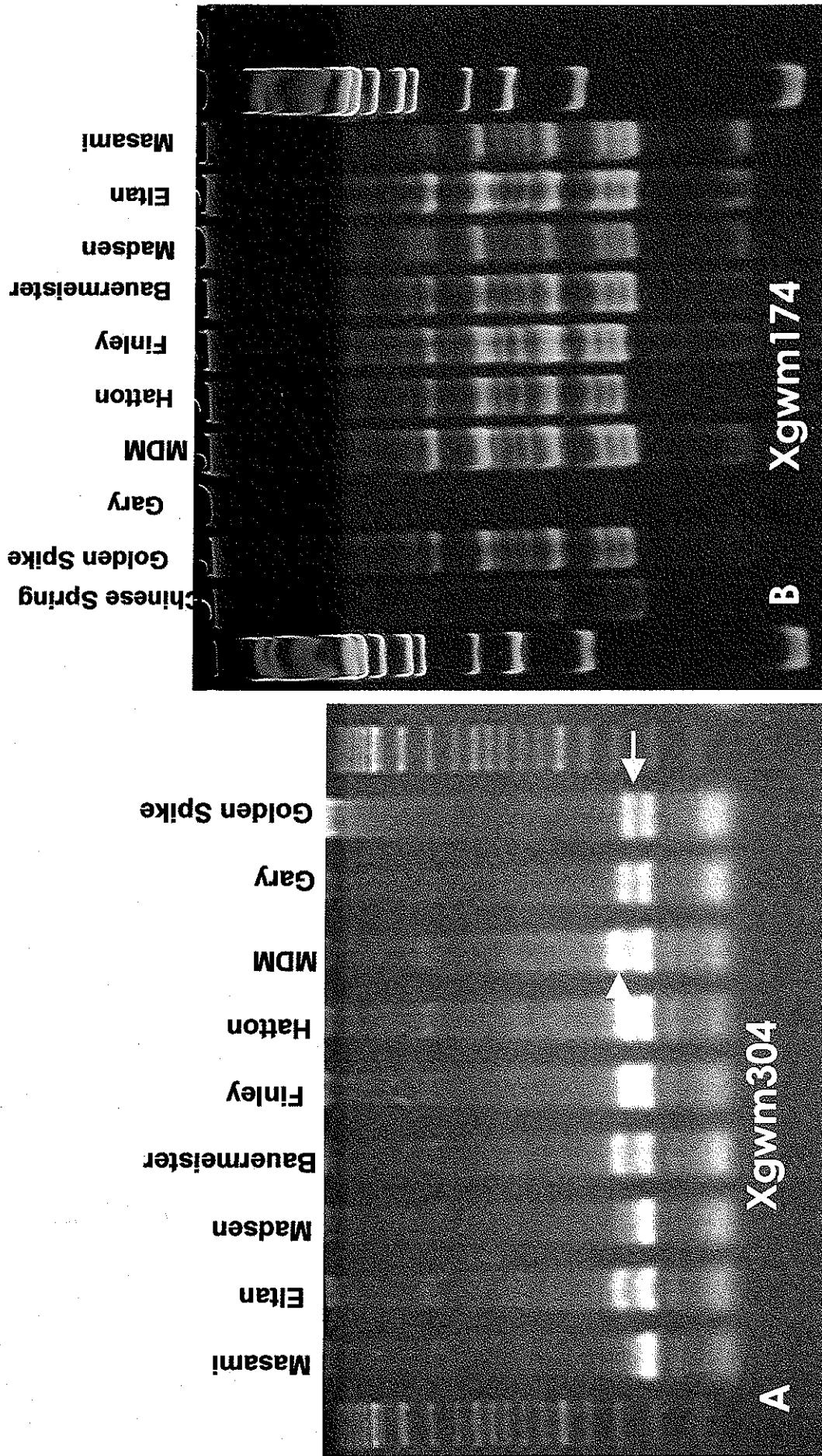


Figure 1. Nucleotide sequence distinctiveness of MDM from cultivars Gary and Golden Spike, as evidenced by microsatellite DNA markers.

- A) In PCR using primers for marker Xgwm304, MDM produces a 290 bp fragment (white arrow) that is of higher molecular weight than the fragment generated in sample of Golden Spike and Gary (yellow arrow).

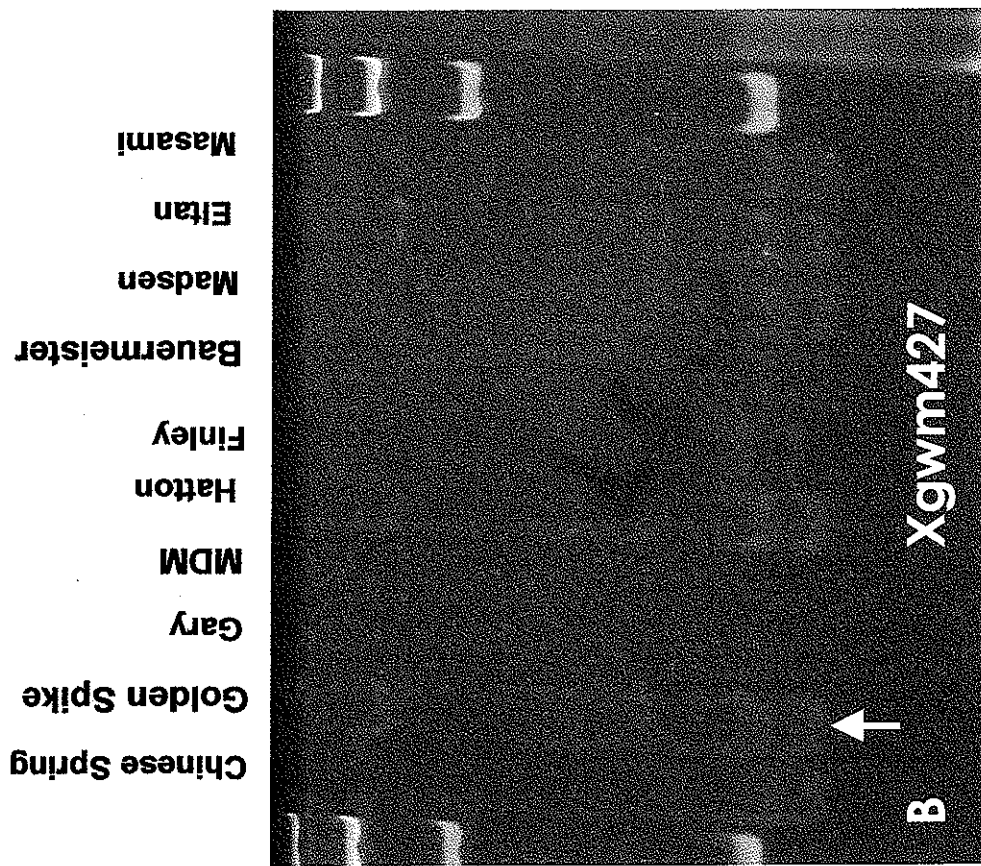
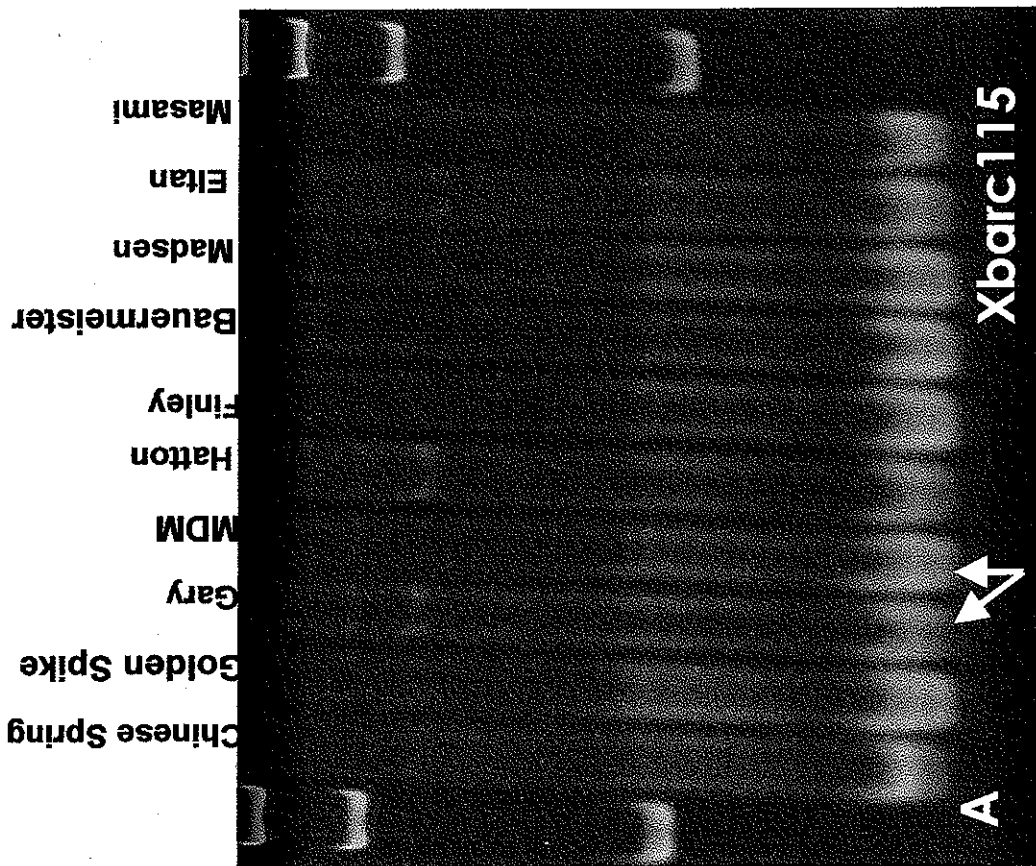


Figure 2. Nucleotide sequence distinctiveness of MDM from cultivars Gary and Golden Spike, as evidenced by novel microsatellite alleles in Golden Spike that are not present in MDM (B) and a novel allele present in MDM and Golden Spike but not in Gary (A).

200600246

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 2.5 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410, or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

**U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MD 20705**

Exhibit C

**OBJECTIVE DESCRIPTION OF VARIETY
Wheat (*Triticum* spp.)**

NAME OF APPLICANT (S) Washington State University Research Foundation	TEMPORARY OR EXPERIMENTAL DESIGNATION WA007936	VARIETY NAME MDM
ADDRESS (Street and No. or RD No., City, State, Zip Code and Country) Dr. Keith Jones, Director Washington State University Research Foundation 1610 NE Eastgate Blvd. Pullman, WA 99163		FOR OFFICIAL USE ONLY PVPO NUMBER 200600246

PLEASE READ ALL INSTRUCTIONS CAREFULLY:

Place the appropriate number that describes the varietal character of this variety in the boxes below. Place a zero in the first box (e.g., or) when number is either 99 or less or 9 or less respectively. Data for quantitative plant characters should be based on a minimum of 100 plants. Comparative data should be determined from varieties entered in the same trial. Royal Horticultural Society or any recognized color standard may be used to determine plant colors; designate system used: _____ . Please answer all questions for your variety; lack of response may delay progress of your application.

1. KIND:

- 1 = Common
2 = Durum
3 = Club
4 = Other (Specify) _____

2. VERNALIZATION:

- 1 = Spring
2 = Winter
3 = Other (Specify) _____

3. COLEOPTILE ANTHOCYANIN:

- 1 = Absent 2 = Present

4. JUVENILE PLANT GROWTH:

- 1 = Prostrate 2 = Semi-Erect 3 = Erect

5. PLANT COLOR: (boot stage)

- 1 = Yellow-Green
2 = Green
3 = Blue-Green

6. FLAG LEAF: (boot stage)

- 1 = Erect 2 = Recurved

- 1 = Not Twisted 2 = Twisted

- 1 = Wax Absent 2 = Wax Present

7. EAR EMERGENCE:

Number of Days (Average)

Number of Days Earlier Than *

Same As *

Number of Days Later Than *

* Golden Spike and Gary

*Relative to a PVPO-Approved Commercial Variety Grown in the Same Trial

8. ANTER COLOR:

- 1 = Yellow 2 = Purple

9

9. PLANT HEIGHT: (from soil to top of head, excluding awns)

099

cm (Average)

13

cm Taller Than Gary *

Same As

Golden Spike *

cm Shorter Than *

200600246

10. STEM:

A. ANTHOCYANIN

1

1 = Absent 2 = Present

B. WAXY BLOOM

1

1 = Absent 2 = Present

C. HAIRINESS (last internode of rachis)

1

1 = Absent 2 = Present

D. INTERNODE

1

1 = Hollow 2 = Semi-Solid 3 = Solid

5

Number of Nodes

E. PEDUNCLE

1

1 = Erect 2 = Recurved 3 = Semi-Erect

27

cm Length

F. AURICLE

1

Anthocyanin: 1 = Absent 2 = Present

1

Hair: 1 = Absent 2 = Present

11. HEAD: (At Maturity)

A. DENSITY

1

1 = Lax
2 = Middense (Laxidense)
3 = Dense

B. SHAPE

4

1 = Tapering
2 = Strap
3 = Clavate
4 = Other (Specify) Fusiform

C. CURVATURE

1

1 = Erect
2 = Inclined
3 = Recurved

D. AWNEDNESS

4

1 = Awnless
2 = Apically Awnletted
3 = Awnletted
4 = Awned

12. GLUMES: (At Maturity)

A. COLOR

1

1 = White
2 = Tan
3 = Other (Specify)

B. SHOULDER

1

1 = Wanting 2 = Oblique
3 = Rounded 4 = Square
5 = Elevated 6 = Apiculate
7 = Other (Specify)

C. SHOULDER WIDTH

2

1 = Narrow
2 = Medium
3 = Wide

D. BEAK

1

1 = Obtuse
2 = Acute
3 = Acuminate

E. BEAK WIDTH

2

1 = Narrow
2 = Medium
3 = Wide

F. GLUME LENGTH

2

1 = Short (ca. 7 mm)
2 = Medium (ca. 8 mm)
3 = Long (ca. 9 mm)

G. WIDTH

2

1 = Narrow (ca. 3 mm)
2 = Medium (ca. 3.5 mm)
3 = Wide (ca. 4 mm)

H. PUBESCENCE

1

1 = Not Present
2 = Present

10

13. SEED:

200600246

A. SHAPE

- ☐ 1 = Ovate
☐ 2 = Oval
☐ 3 = Elliptical

B. CHEEK

- ☐ 1 = Rounded
☐ 2 = Angular

C. BRUSH

- ☐ 1 = Short
☐ 2 = Medium
☐ 3 = Long
- ☐ 1 = Not Collared
☐ 2 = Collared

D. CREASE

- ☐ 1 = Width 60% or less of Kernel
☐ 2 = Width 80% or less of Kernel
☐ 3 = Width Nearly as Wide as Kernel

- ☐ 1 = Depth 20% or less of Kernel
☐ 2 = Depth 35% or less of Kernel
☐ 3 = Depth 50% or less of Kernel

E. COLOR

- ☐ 1 = White
☐ 2 = Amber
☐ 3 = Red
☐ 4 = Other (Specify) _____

F. TEXTURE

- ☐ 1 = Hard
☐ 2 = Soft
☐ 3 = Other (Specify) _____

G. PHENOL REACTION (See Instructions)

- ☐ 1 = Ivory
☐ 2 = Fawn
☐ 3 = Light Brown
☐ 4 = Dark Brown
☐ 5 = Black

H. SEED WEIGHT

- ☐ 3 ☐ 6 g/1000 Seed (whole number only)

I. GERM SIZE

- ☐ 2 = Small
☐ 2 = Midsize
☐ 3 = Large

14. DISEASE: PLEASE INDICATE THE SPECIFIC RACE OR STRAIN TESTED

(0 = Not Tested 1 = Susceptible 2 = Resistant 3 = Intermediate 4 = Tolerant)

<input type="checkbox"/> 0 Stem Rust (<i>Puccinia graminis</i> f. sp. <i>tritici</i>)	<input type="checkbox"/> 3 Leaf Rust (<i>Puccinia recondita</i> f. sp. <i>tritici</i>)
<input type="checkbox"/> 2 Stripe Rust (<i>Puccinia striiformis</i>)	<input type="checkbox"/> 0 Loose Smut (<i>Ustilago tritici</i>)
<input type="checkbox"/> 0 Tan Spot (<i>Pyrenophora tritici-repentis</i>)	<input type="checkbox"/> 0 Flag Smut (<i>Urocystis agropyri</i>)
<input type="checkbox"/> 0 Halo Spot (<i>Selenophoma donacis</i>)	<input type="checkbox"/> 0 Common Bunt (<i>Tilletia tritici</i> or <i>T. laevis</i>)
<input type="checkbox"/> 0 Septoria nodorum (Glume Blotch)	<input type="checkbox"/> 2 Dwarf Bunt (<i>Tilletia controversa</i>)
<input type="checkbox"/> 0 Septoria avenae (Speckled Leaf Disease)	<input type="checkbox"/> 0 Karnal Bunt (<i>Tilletia indica</i>)
<input type="checkbox"/> 0 Septoria tritici (Speckled Leaf Blotch)	<input type="checkbox"/> 1 Powdery Mildew (<i>Erysiphe graminis</i> f. sp. <i>tritici</i>)
<input type="checkbox"/> 0 Scab (<i>Fusarium</i> spp.)	<input type="checkbox"/> 2 "Snow Molds"
<input type="checkbox"/> 0 "Black Point" (Kernel Smudge)	<input type="checkbox"/> 0 Common Root Rot (<i>Fusarium</i> , <i>Cochliobolus</i> and <i>Bipolaris</i> spp.)
<input type="checkbox"/> 0 Barley Yellow Dwarf Virus (BYDV)	<input type="checkbox"/> 0 Rhizoctonia Root Rot (<i>Rhizoctonia solani</i>)
<input type="checkbox"/> 0 Soilborne Mosaic Virus (SBMV)	<input type="checkbox"/> 0 Black Chaff (<i>Xanthomonas campestris</i> pv. <i>translucens</i>)
<input type="checkbox"/> 0 Wheat Yellow (Spindle Streak) Mosaic Virus	<input type="checkbox"/> 0 Bacterial Leaf Blight (<i>Pseudomonas syringae</i> pv. <i>syringae</i>)
<input type="checkbox"/> 0 Wheat Streak Mosaic Virus (WSMV)	<input type="checkbox"/> 1 Other (Specify) <u>Eye spot foot rot (<i>Pseudocercospora herpotrichoides</i>)</u>
<input type="checkbox"/> Other (Specify) _____	<input type="checkbox"/> Other (Specify) _____
<input type="checkbox"/> Other (Specify) _____	<input type="checkbox"/> Other (Specify) _____
<input type="checkbox"/> Other (Specify) _____	<input type="checkbox"/> Other (Specify) _____

15. INSECT: (0 = Not Tested 1 = Susceptible 2 = Resistant 3 = Intermediate 4 = Tolerant)

PLEASE SPECIFY BIOTYPE (where needed)

<input type="checkbox"/> 0 Hessian Fly (<i>Mayetiola destructor</i>)	<input type="checkbox"/> Other (Specify) _____
<input type="checkbox"/> 0 Stem Sawfly (<i>Cephus</i> spp.)	<input type="checkbox"/> Other (Specify) _____
<input type="checkbox"/> 0 Cereal Leaf Beetle (<i>Oulema melanopa</i>)	<input type="checkbox"/> Other (Specify) _____

15. INSECT: (continued) (0 = Not Tested 1 = Susceptible 2 = Resistant 3 = Intermediate 4 = Tolerant)

200600246

PLEASE SPECIFY BIOTYPE (Where Needed)

<input type="checkbox"/> 0	Russian Aphid (<i>Diuraphis noxia</i>)	<input type="checkbox"/>	Other (Specify) _____
<input type="checkbox"/> 0	Greenbug (<i>Schizaphis graminum</i>)	<input type="checkbox"/>	Other (Specify) _____
<input type="checkbox"/> 0	Aphids	<input type="checkbox"/>	Other (Specify) _____

16. ADDITIONAL INFORMATION ON ANY ITEM ABOVE, OR GENERAL COMMENTS:

EXHIBIT D. OPTIONAL SUPPORTING INFORMATION**Milling and Baking Quality:**

MDM has test weight less than Finley, Hatton, and Eltan. Its kernel hardness (SK Hardness) is greater than Finley and Eltan, but less than Hatton while its kernel weight (SK Weight) is less than Finley and Eltan, but greater than Hatton. Flour yield of MDM is less than Finley, but similar to Hatton and Eltan. The milling quality (Mill Score) of MDM is similar to Eltan, but less than Finley and Hatton. The flour ash yield of MDM is similar to Eltan, and greater than Finley and Hatton. Its protein strength (Mixograph Abs) is less than Finley, but equal to Hatton and Eltan. The mix time of MDM is longer than Finley, Hatton and Eltan. Its loaf volume is equal to Hatton and less than Finley and Eltan. Crumb grain score for MDM is higher than Finley and equal to Hatton and Eltan (Table D1).

Table D1: Means, least significant difference (LSD), probability (P-VALUE) and number of pairwise comparisons made (N) for various milling and baking characteristics between MDM and check varieties Finely, Hatton, and Eltan.

COMPARISON	TEST WEIGHT	SK HARDNESS	SK WEIGHT	WHEAT PROTEIN	BAKE ABS
MDM	62.0	71.4	34.6	12.3	65.3*
Finely	63.5*	71.8	36.9*	12.9	67.2*
LSD	0.40	3.30	1.10	0.70	1.40
P-VALUE	<0.01	0.83	<0.01	0.07	<0.01
N	19	19	19	19	19
MDM	61.8	68.4	34.9*	12.0	65.3
Hatton	63.9*	77.6*	31.2	12.1	65.4
LSD	0.60	6.50	1.50	0.70	1.60
P-VALUE	<0.01	0.01	<0.01	0.59	0.90
N	10	10	10	10	10
MDM	62.0*	70.9*	34.6	12.2	65.2*
Eltan	61.6	32.4	34.7	12.0	60.7
LSD	0.30	2.80	0.90	0.50	1.30
P-VALUE	0.01	<0.01	0.69	0.04	<0.01
N	18	18	18	18	18

COMPARISON	MIXOGRAPH ABS	MIX TIME	LOAF VOLUME	CRUMB GRAIN	ALKALINE NOODLE COLOR	
					COLOR	DELTA L
MDM	62.2	3.7*	873.0	5.1		
Finely	64.2*	2.9	966*	5.7		
LSD	1.30	0.30	42.00	0.80		
P-VALUE	<0.01	<0.01	<0.01	0.12		
N	19	19	19	18		
MDM	62.2	3.6*	863.0	5.1		
Hatton	62.4	2.9	868.0	4.3*		
LSD	1.40	0.60	57.00	0.60		
P-VALUE	0.76	0.03	0.83	0.02		
N	10	10	10	19		
MDM	62.0*	3.7	870.0	4.9	82.2	6.9
Eltan	58.4	3.9	863.0	4.9	84.9	5.1*
LSD	1.70	0.30	39.00	1.30	1.10	0.6
P-VALUE	<0.01	0.13	0.71	<0.01	<0.01	<0.01
N	18	18	18	10	17	17

* Significantly different at alpha = 0.05.

200600246

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). The information is held confidential until the certificate is issued (7 U.S.C. 2426).

EXHIBIT E
STATEMENT OF THE BASIS OF OWNERSHIP

1. NAME OF APPLICANT(S) Washington State University Research Foundation	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER WA007936	3. VARIETY NAME MDM
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP, and Country) Dr. Keith Jones, Director Washington State University Research Foundation 1610 NE Eastgate Blvd. Pullman, WA 99163	5. TELEPHONE (Include area code) (509) 335-4363	6. FAX (Include area code) (509) 335-7237
7. PVPO NUMBER		200600246

8. Does the applicant own all rights to the variety? Mark an "X" in the appropriate block. If no, please explain. ☒ YES ☐ NO

9. Is the applicant (individual or company) a U.S. national or a U.S. based company? If no, give name of country. ☒ YES ☐ NO

10. Is the applicant the original owner? ☒ YES ☐ NO If no, please answer one of the following:

a. If the original rights to variety were owned by individual(s), is (are) the original owner(s) a U.S. National(s)?

☐ YES ☐ NO If no, give name of country

b. If the original rights to variety were owned by a company(ies), is (are) the original owner(s) a U.S. based company?

☐ YES ☐ NO If no, give name of country

11. Additional explanation on ownership (Trace ownership from original breeder to current owner. Use the reverse for extra space if needed):

MDM was developed by Dr. Stephen S. Jones, winter wheat breeder and geneticist, Washington State University.
Washington State University's ownership interests are assigned to the Washington State University Research Foundation.

PLEASE NOTE:

Plant variety protection can only be afforded to the owners (not licensees) who meet the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.
2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.
3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

The original breeder/owner may be the individual or company who directed the final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definitions.

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 0.1 hour per response, including the time for reviewing the instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, sexual orientation, marital or family status, political beliefs, parental status, or protected genetic information. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, D.C. 20250-9410 or call (202) 720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.